306).

← INSERT PAGE 3A

It has now been found that it is possible to overcome the above disadvantages and obtain optimum catalyst performances, using much lower quantities of active component, by means of the catalyst of the present invention containing rhenium and an inert carrier such as alumina, characterized in that said carrier is subjected to a prior silanization treatment with a compound containing chlorine, before impregnation with the active component, and the activation of the heterogeneous catalyst takes place by means of thermal treatment followed by a rapid final cooling.

This catalyst is active in metathesis reactions even when used without a co-catalyst and reduces problems relating to the formation of isomers or secondary reactions obtaining a high selectivity.

In accordance with what is specified above, an object of the present invention therefore relates to a process for the preparation of a heterogeneous catalyst active in metathesis reactions of olefins containing rhenium as active component and alumina as inert carrier medium, characterized in that the inert carrier medium is treated with a silanizing agent having the general formula

$$R_nSiCl_m \qquad (I)$$

wherein R represents an amine or a C_1-C_{25} (iso)alkyl, C_5-C_{25} cyclo-alkyl, C_6-C_{18} aromatic or C_7-C_{25} alkyl aromatic radi-

A further example of a catalyst is disclosed in US-A-2003/0023125, teaching a catalyst for olefins metathesis, comprising at least one porous mineral carrier based on alumina, at least one compound of rhenium, molybdenum or tungsten and further including silicon in an oxide form, the alumina carrier being treated with compounds containing Si-O bonds.

catalyst $SnMe_4$ in 100 ml of hexane, are charged, in an argon atmosphere, into a 150 ml tailed flask.

The resulting mixture is maintained under light stirring, at 25°C for 10 minutes and 26 ml of 1-hexene are then added.

After 10 minutes, the reaction mixture is analyzed via gas chromatography using an internal standard. The following results are obtained:

- conversion of 1-hexene 55%
- selectivity of 5-decene 100%

EXAMPLE 3 (Comparative)

Preparation of catalyst B

10 g of γ-alumina with a surface of 180 m^2/g and a porosity of 0.5 ml/g, are pre-calcined in a muffle at 110°C for 1 hour in a stream of air and subsequently at 550°C for 4 hours in a stream of air.

The carrier is then wet four times with 5 ml of an aqueous solution containing 0.28 g of NH_4ReO_4, the water is evaporated, between one impregnation and the next, by keeping the sample in an oven at 60°C.

The carrier is calcined first at 110°C for 1 hour in a stream of dry air and then at 550°C for 3 hours in a stream of dry air and for 1 hour in a stream of nitrogen. The reactor is then extracted from the muffle and cooled for 15 minutes in a stream of nitrogen

CLAIMS

1. A process for the preparation of a heterogeneous catalyst active in metathesis reactions of olefins containing rhenium as active component and alumina as inert carrier medium, characterized in that the inert carrier is treated with a silanizing agent having the general formula

$$R_nSiCl_m \qquad (I)$$

wherein R represents an amine or a C_1-C_{25} (iso)alkyl, C_5-C_{25} cyclo-alkyl, C_6-C_{18} aromatic or C_7-C_{25} alkyl aromatic radical, optionally containing at least one heteroatom selected from O, S and N; n is an integer so that $1 < n < 3$; m is an integer so that $1 < m < 3$.

2. The process according to claim 1, wherein the treatment of the carrier is effected using the silanizing agent as such or by means of dissolution of the silanizing agent in a solvent, the alumina being maintained in the presence of the solution of the silanizing agent, for a time ranging from 0.5 to 24 hours, at a temperature ranging from -10 to 100°C, and subjecting the alumina to optional thermal treatment ranging from 400 to 600°C.

3. The process according to claim 1 or 2, wherein the alumina has a surface area greater than 50 m^2/g and a total cumulative pore volume greater than 0.01 ml/g.

10. A process for the conversion of olefins by means of a metathesis reaction characterized in that it is carried out in the presence of a heterogeneous catalyst active in metathesis reactions of olefins containing rhenium as active component and alumina as inert carrier medium, characterized in that the inert carrier is treated with a silanizing agent having the general formula

$$R_nSiCl_m \qquad (I)$$

wherein R represents an amine or a C_1-C_{25} (iso)alkyl, C_5-C_{25} cyclo-alkyl, C_6-C_{18} aromatic or C_7-C_{25} alkyl aromatic radical, optionally containing at least one heteroatom selected from O, S and N; n is an integer so that $1 < n < 3$; m is an integer so that $1 < m < 3$.

11. The process according to claim 10, wherein the metathesis reaction can be homo-metathesis or co-metathesis.

12. The process according to claim 10, wherein the olefins are selected from mono-olefins having from 2 to 30 carbon atoms, cyclo-olefins having from 3 to 20 carbon atoms, polyolefins having from 6 to 30 carbon atoms, cyclo-polyolefins having from 5 to 30 carbon atoms.

13. The process according to claim 12, wherein the mono-olefins are selected from ethylene, propylene, butene, pentene, hexene.

14. The process according to claim 12, wherein the cyclo-olefins are selected from cyclo-pentene, cyclo-octene, norbornene.

15. The process according to claim 12, wherein the poly-olefins are selected from 1,4-hexadiene and 1,7-octadiene.

16. The process according to claim 12, wherein the cyclo-polyolefins are selected from 1,5-cyclo-octadiene, norbordiene dicyclopentadiene.

17. The process according to claim 12, wherein the mono-olefins or polyolefins, linear or cyclic, can carry functional groups such as, for example, halogens or ester groups such as methyl oleate.

18. The process according to claim 10, wherein the metathesis reaction is carried out at a temperature ranging from 0 to 100°C and a pressure ranging from 0 to 10 MPa (0 to 100 bar).

19. The process according to claim 18, wherein the metathesis reaction is carried out at a temperature ranging from 25 to 60°C and a pressure ranging from 0.1 to 6 MPa (1 to 60 bar).

20. The process according to claim 10, wherein the metathesis reaction is carried out in gas phase or in liquid phase with or without a solvent selected from ethers, aliphatic and aromatic hydrocarbons.

21. The process according to claim 20, wherein the solvent is selected from ethyl ether, hexane, heptane, toluene.

22. The process according to claim 10, wherein the quantity of catalyst ranges from 1 to 50% by weight with respect to the reaction mixture.

23. The process according to claim 22, wherein the quantity of catalyst ranges from 1 to 10% by weight with respect to the reaction mixture.

24. The process according to claim 10, wherein the metathesis reaction is carried out batchwise or in continuous.